HOSTOS COMMUNITY COLLEGE
DEPARTMENT OF MATHEMATICS

MAT 100 SI   **Introduction to College Mathematics I**

CREDIT HOURS: 3.0

EQUATED HOURS: 6.0

CLASS HOURS: 6.0

PREREQUISTES: None

RECOMMENDED   **Angel, Abbott, Runde, A Survey of Mathematics with**
TEXTS: **Applications (2012), 9th Edition. ISBN13:9780321759665**

DESCRIPTION: **This course provides skills in finite mathematics. Topics: set**
                       theory, symbolic logic, systems of numeration, and the metric
                       system.

EXAMINATIONS: **A minimum of two partial tests (suggested 15% each) a**
                       midterm test (suggested 30%) and a comprehensive
                       departmental final examination (suggested 40%).

GRADES: **A, A-, B+, B, B-, C+, C, D, I, F.**

LEARNING OUTCOMES FOR MAT 100 SI:

The main aim of student learning outcome is to understand the following Mathematical
concepts. In order to reach these understanding, students will:

1. Interpret and draw appropriate inferences from quantitative and qualitative
    representations, such as Venn diagrams, truth tables etc.

2. Use numerical and statistical methods as well techniques from probabilities and
    number theory to draw accurate conclusions and solve mathematical problems.

3. Represent quantitative problems expressed in natural language in a suitable mathematical format such as use of Venn diagrams, logical statements, measure of center, spread or variation, system of numeration in base 10 and operation of bases other than 10.

4. Effectively communicate quantitative analysis or solutions to mathematical problems in written form such as set theory notation, Venn diagrams, logic statements, DeMorgan's law of sets and DeMorgan's law of logic.

5. Evaluate solutions to problems for reasonableness. Recognize patterns and use these patterns for predicting the general term in a sequence.

6. Apply mathematical methods to problems in other fields of study including Economic, Computer Science, Statistics, Modular number theory and Probabilities.

MAT 100 SI
COURSE OUTLINE

I.   SEQUENCES OF REAL NUMBERS
    1. Addition of signed numbers
    2. Subtraction of signed numbers
    3. Multiplication of signed numbers
    4. Division of signed numbers
    5. Arithmetical Progressions
    6. Multi-level Arithmetical Progressions
    7. Geometrical Progression
    8. Harmonic Progressions

II.   FACTORIZATION AND PRIME NUMBERS:
    1. Addition of fractions with the same denominator
    2. Subtraction of fractions with the same denominator
    3. Addition of fractions with the different denominators
    4. Subtraction of fractions with the different denominators
    5. Multiplication of fractions
    6. Division of fractions
    7. Find the factors of any counting numbers
    8. Distinguish between prime and composite number
    9. Find the prime factorization of any counting number

III. PROBABILITY
   1. Percent
   2. The three types of percent problems
   3. Change percent to decimal and to fraction
   4. Find the probability of an event such as rolling a dice, picking a card from a random deck or tossing a coin.
   5. Describe the sample space of a probability experiment.
   6. Find the probability of two events occurring that are mutually exclusive
   7. Find the probability of two events occurring that are not mutually exclusive.

IV. PLACE VALUE IN THE DECIMAL SYSTEM:
   1. Write numbers in expanded notation
   2. Write numbers in the decimal notation

V. OTHER BASES:
   1. Discover other systems of notation
   2. Write numbers in other bases
   3. Translate numbers from base 10 to base x
   4. Translate numbers from base x to base 10

VI. OPERATION IN OTHER BASES:
   1. Perform addition in bases 2, 5 and 12
   2. Perform addition in bases 2, 5 and 12
   3. Perform multiplication in bases 2, 5 and 12
   4. Perform division in bases 2, 5 and 12

VII. MOLULAR ARITHMETIC:
   1. Add and subtract on a 12-hour clock
   2. Multiply and divide on a 12-hour clock
   3. Working with negative numbers on a clock
   4. Compute in arithmetic modulo 5
   5. Working with negative numbers in arithmetic modulo 5
   6. Compute in arithmetic modulo10
   7. Working with negative numbers in arithmetic modulo 10

VIII. THE METRIC SYSTEM:
   1. Definition of a number written in scientific notation with examples
   2. Change a number written in scientific notation to standard notation
   3. Change a number written in standard notation to scientific notation
   4. Multiply numbers written in scientific notation
   5. Divide numbers written in scientific notation
   6. Units of measure in the metric system
   7. Conversion of measurements within the metric system
   8. Conversion between the Metric and English systems

   Midterm

IX.   NUMBERS AND NUMERALS:
1. Define number and numeral
2. Write Roman (Egyptian) numerals
3. Compute in the Roman (Egyptian) system of numeration

X.   BASIC DEFINITIONS AND PROPERTIES OF SET:
1. Define set, subset, proper subset, empty set, universal set
2. Describe sets by rule and roster
3. Define complement of a set
4. Find the number of subsets that can be formed from an indefinite set
5. Identify equivalent sets
6. Classify sets as finite or infinite

XI.   RELATIONSHIPS BETWEEN SETS:
1. Define and find the intersection of sets
2. Define and find the union of sets

XII.   SETS OF POINTS:
1. Draw Venn diagrams illustrating the union of sets
2. Draw Venn diagrams illustrating the intersection of sets
3. Use Venn diagrams to show that two sets are equal

XIII.   BASIC DEFINITIONS AND PROPERTIES OF SETS:
1. Classify numbers as ordinal, or cardinal
2. Construct a one-to-one correspondence between the elements of two sets

XIV.   LOGICAL STATEMENTS:
1. Translate English statements into symbolic form
2. Write the negation, conjunction and disjunction of given statements
3. Write the converse, inverse and contrapositive of given statements

XV.   TRUTH TABLE:
1. Give a truth value to a given compound statement
2. State whether or not two given statements are equivalent.
3. Determine whether or not a given statement is a tautology.

Final Exam